

known waters with the usual beacon-lights of chemical identity gone, I mean such data as melting points, crystalline form, and so on. Finally, it seems that the publication of work such as that of Dr. Osborne on the border-land of botany and chemistry may bring together the two sister sciences which, too long, have trod paths that are somewhat parallel but still too widely separated.

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PROCEEDINGS OF THE CLUB

MAY 25, 1910

The Club met at the Museum of the New York Botanical Garden at 3:30 P.M. Dr. M. A. Howe occupied the chair. Twelve persons were present. The minutes of the last meeting, May 10, were approved.

A letter was read from the recording secretary of the New York Academy of Sciences in which he stated that he knew of no arrangements whereby the expenses of popular lectures given by the affiliated societies at the American Museum of Natural History could be met by the funds of the Academy. It was voted that the treasurer of the Club meet the bills incurred at the meetings of March 8 and April 12.

First on the announced scientific program was a paper entitled "Moss Notes" by Mr. R. S. Williams, of which the following is an abstract prepared by the speaker.

"*Leucobryum* or white-moss is so called from the structure of the leaf which is about like *Sphagnum* in having the chlorophyll-cells surrounded by hyaline, empty, porose cells, thus giving a whitish appearance to the moss. The fruit, of course, is very different from *Sphagnum*, much resembling that of *Dicranum*. *Leucobryums* are chiefly tropical although the type of the genus, *L. glaucum*, is widely distributed over Europe and in North America from Labrador to Florida and westward to the Mississippi valley. There have been over 120 species described, many of which can scarcely be considered as well defined. Out of some eighteen or twenty species credited to North and Central

America and the West Indies, I have been unable to distinguish more than seven or eight that seem fairly distinct. The fruit is very similar in the different species and of little specific value. The leaves consist largely of a very broad costa, several layers of cells in thickness, and this costa viewed in cross-section furnishes some of the best characters in separating the species. One of the most interesting features of the genus is the inflorescence. It has usually been described as dioicous and both Schimper and Braithwait figure male plants, three or four cm. high, growing in separate tufts. In the five or six species I have examined where antheridia occurred I have only found minute male plants one to rarely five or six mm. high and these were always growing on fruiting plants attached to tomentum enclosed by perichaetial leaves of infertile archegonia, or more rarely on the inner side of the tubulose stem leaves. It would be interesting to discover whether or not a distinctly dioicous inflorescence ever occurs, with male plants of large size."

The second paper of the afternoon was by Mr. E. D. Clarke on "The Rôle of the Oxidizing Ferments in Plants."

The following abstract was prepared by Mr. Clarke:

"The oxidizing ferments or enzymes are very widely distributed in both the higher and lower plants. Since all other enzymes seem to be produced by plants or animals for some definite purpose in the life of the organism, it was natural that speculation should arise regarding the function of the oxidizing enzymes of the plant. Little is known of the nature of these enzymes but their activity may best be described by saying that they act as accelerators of the ordinary processes of oxidation. It seems likely that the oxidizing ferments assist the plant in carrying on the oxidative processes of respiration by increasing the rapidity of the combination of oxygen with the oxidizable substances of the plant body. In the self-destructive processes of anaerobic respiration, these ferments probably play the same part. An illustration of the latter type is found in the case of the spadix of *Arum maculatum* which sometimes reaches a temperature of 20° C. above its surroundings. Certain of the higher plants and fungi change color very rapidly upon injury; the resulting ex-

posure of the tissues to atmospheric oxygen, in the presence of oxidizing enzymes, causing the oxidation of colorless substances to those of varied color. During the normal life of the plant it seems to be able to hold these enzymes in check, but after death or interference with its functions, the enzymes run riot; thus causing blackening and colorations of many sorts. The blackening of the foliage of many plants after a frost and the production of the red and gold of our autumn forests may well be due to the excessive activity of the oxidizing enzymes. The color of black tea, the odor of valerian, the aroma of vanilla-beans, etc. have all been attributed to this same cause. The presence of these ferments in the roots of growing plants seem to enable them to destroy certain poisonous substances in the medium in which they grow. There is a disease of tobacco known as the 'mosaic disease' which is characterized by the checkered appearance of the leaves, these checkered places being yellow in color. Woods showed that rapid growth, produced by cutting back or by excessive manuring, often caused this disease which he attributed to an abnormal activity of the oxidizing enzymes. It has also been shown that they may cause the destruction of chlorophyll. Now, most of the lower fungi contain these enzymes, so the yellowing produced by their attacks upon green leaves may be due to their activity. It is evident then, that in the plant the oxidizing ferments have a physiological and also a pathological rôle that are not well understood but which deserve further investigation."

Dr. P. A. Rydberg reviewed the Monograph of *Sambucus* by Fritz Graf von Schwerm. This paper will be published at a later date.

Adjourned.

PERCY WILSON,
Secretary

OF INTEREST TO TEACHERS

THE BOTANY UNIT

At the March meeting of the Commission on Accredited Schools of the North Central Association (including 13 states), the botany unit statement mentioned earlier in *TORREYA* was adopted.